Beyond Income Differentials: Explaining Migrants' Destinations in Mexico

Estela Rivero-Fuentes

Introduction

Internal migration is a phenomenon of great demographic and social importance in developing countries. Rapid urbanization within many countries throughout the world during the 1960s and 1970s is mainly explained by an intense migration from rural areas to the cities. During the 1980s and the 1990s new patterns of migration emerged in many countries, and migrants started moving from urban centers to other urban centers, and from rural areas to other rural areas. Consequently, internal migration is still the most important factor in determining the distribution of the population in many Latin American, Asian and African countries. As a result, policy makers need to rely on accurate forecasts of internal migration when assessing and planning for the future housing, education and health needs of the different regions in a country.

Despite its importance, our understanding of internal migration is still limited. Past empirical studies attempting to explain why migrants go to some regions in a country and not to others have very large residual errors and commonly fail to predict which are the regions that are more likely to receive migrants (see for example, {Davies, 2001 #427}, {Lin, 1998 #396; Grusky, 1998 #397; Zhu, 1998 #491}).

One of the reasons why empirical studies of internal migration give such poor results in predicting migrants' destinations is that most of them are based exclusively on the neoclassical hypothesis that migrants go to the states with highest wages and occupation rates, and which are closest in distance from their origin. Economic Sociology

argues that other factors like past migration, trade and infrastructure ties between sending and receiving areas might alternatively affect the distribution of migrants across destinations. However, the importance of these factors has not yet been tested in any study of internal migration.

In addition, there are very few studies that try to explain the emergence in the 1980s of new patterns of migration in many developing countries. The few studies that do so, give ad-hoc explanations and do not contrast their hypotheses or findings with other alternative explanations (see for example {Chávez, 1999 #285; Escobar, 1999 #132}for the case of Mexico; and {Liang, 1996 #395} for the case of China).

This paper attempts to contribute to the literature of internal migration in developing countries in several ways. Taking the case of interstate migration in Mexico in three different periods (1975-1980, 1985-1990 and 1995-2000), I test whether or not the level of past migration, past and recent trade, and administrative and infrastructure ties explain why migrants from different states of origin go to different destinations. To my knowledge, this is the first study of internal migration in any country that tests the explanatory power of variables other than the ones implied by the neoclassical hypotheses in explaining migrants' destinations. Furthermore, this is the first study of internal migration that takes a 30-year historical perspective and explores the determinants of migrants' destinations in different periods.

Additionally, I explore whether the transformation of migrants' destinations after 1980 is a result of changes in labor market conditions, distance and trade between states, or if it is a result of changes in the relative importance of each of these variables. In particular, I explore whether changes in the labor market conditions have been more

important than changes in trade. This is also the first study that attempts to evaluate the relative importance of different factors in the changes of migration patterns.

Background

Most studies that try to explain why individuals migrate to the destinations they do and not to other places rely on the neoclassical theory of migration {De Jong, 1999 #399; Greenwood, 2003 #405}. This theory was originally formulated by Harris and Todaro in 1970, and proposes that individuals migrate because they seek to maximize their expected long-term earnings. According to this theory, an individuals' migration decision-making process consists of a comparison of his/her expected earnings in the place he/she lives with the earnings he/she could make in alternative destinations, given the costs of the migration {Harris, 1970 #185}. The individual decides to migrate if his/her expected earnings somewhere else are greater than the earnings he/she expects to make in their current place of residence. If he/she decides to migrate, the individual will move to the place where he/she has the highest expected earnings. The expected long term earnings in each possible destination are approximated through the average income times the probability of finding a job minus the cost of moving.

In the aggregate level, the neoclassical theory predicts that the probability of outmigration is positively correlated with the unemployment rate in the place of origin and negatively correlated with its income level. Among those individuals who migrate, the probability of moving to any particular destination is positively associated with the income level of the destination, and negatively correlated with the unemployment level in

the destination and with the distance separating origin and destination {Greenwood, 1985 #81}.

Nevertheless, the neoclassical theory does not explain completely why individuals moving within their country migrate to the places they do. Studies of internal migration that try to explain the choice of migrants' destinations based on income levels, unemployment and distance alone generally have very large residual errors and provide a bad fit to the data {Lucas, 1997 #292}. Furthermore, in many cases the variables measuring economic opportunity (e.g. unemployment and income levels) in the destination are not associated with the probability of migration, or are associated in a direction opposite to what the neoclassical theory would predict (Greenwood, 1975 and 1985). For example, in a review of the literature on internal migration in developing and developed countries, Greenwood (1985) finds that in many empirical studies the unemployment rate of the place of destination is not significantly associated with, or has a negative effect on the immigration rate.

One of the possible causes for the failure of the neoclassical theory of migration to explain accurately migrants' destinations is that it assumes that individuals have complete information about all the alternative destinations they can migrate to. In other words, the neoclassical theory assumes that prospective migrants know the distance that separates them from all the possible destinations, and the wages and unemployment rate in each place. Only if they know what to expect in any destination, can migrants choose to migrate to the place that maximizes their long-term earnings.

However, individuals might not be equally informed about the conditions in all the possible destinations in a country. Also, individuals might consider only some of the

states in a country as alternative destinations. When making their migratory decisions, individuals choose among those places they have some information about. But they do not migrate to the places that they are unaware of, despite the fact that they might have higher earnings there.

The contact with individuals who have migrated before, geographical closeness, easy access by transportation, trade, recruitment, and past political, cultural, social or economic ties between the place of origin and the destination are several of the factors that contribute to individuals having more information about some destinations than about others. The literature on international migration has already demonstrated that these factors have an important role in determining the direction of international flows. Furthermore, the explanations articulated in several studies of international migration suggest that these mechanisms might also operate in the case of internal migration. Some studies have explored the effect of past migration on the choice of internal migrants' destinations (see for example, {Davis, 2002 #430} and {Zhu, 1998 #491}). However, no study has yet explored systematically whether transportation, trade and past ties between origin and destination contribute to explain internal migration or not.

According to the theory of cumulative causation, past migrants inform friends and family in their home town about job opportunities in the places they migrated to, and make them aware that they can be better off if they migrate to that destination than if they remain in their place of origin. In addition, individuals who have migrated before help others migrate by helping them find a job or assist them during the migration and settlement process {Choldin, 1973 #36; Massey, 1987 #84}{Massey, 1990 #86}. As the number of migrants increases, communities develop a “culture of migration”. Migration

becomes a rite of passage for young people, even for those who do not have a family or friendship tie with a past migrant {Kandel, 2002 #486}

The effect of the number of past migrants in the choice of destination has been demonstrated, among other cases, for migrants from the United States {Bratsberg, 1996 #487}, Portugal {Borges, 2002 #489}, and Italy {Moretti, 1999 #490}. Bratsberg and Del (1996) study the factors that explain the migration of U.S. citizens to 65 countries in 1993. These authors find that the probability of U.S. migrants going to a country increases with the number of U.S. citizens already living there, even after they control for distance, language and for the economic and political conditions of the country of destination.

In the case of Mexican migration, the importance of cumulative causation has been demonstrated for internal and international migration from rural communities ({Davis, 2002 #430} and {Fussell, 2004 #372}, respectively) but not for international migration out of urban areas {Fussell, 2004 #372}. Davis, Stecklov and Winters (2002) show that in rural communities the number of migrants who have moved to an urban area increases the probability of new migrants moving to a city instead of to another rural area. Similarly, the number of migrants who have moved to a rural area increases the probability of new migrants going to a rural area rather than to an urban area.

Past political and cultural ties between countries are other factors that studies of international migration have found to be associated with migrants' choice of destination. Colonization promotes migration because the population in the colony identifies the colonizing country with some economic conditions that they cannot attain at home. In addition, easier transportation, a shared language, some common cultural traits, and

special legal conditions facilitate migration between the two countries {Cohen, 1987 #89; Petras, 1981 #225; Portes, 1978 #124}.

In the case of internal migration, it is not political but administrative and commercial ties that might promote migration to some parts of the country. In many developing countries, governmental and commercial activity concentrates in two or three of the largest cities in the country. These cities serve as the administrative centers for the population in the surrounding states, and in many cases they also have a strong influence upon the local mass media {Hardoy, 1983 #328; Portes, 1997 #327}. In addition, because of better roads and more options for public transportation, communication with these cities is usually easier than communication with other parts of the country, despite the distance[1]. In consequence, individuals are more likely to identify the city that serves as the administrative center of the region they live in as a place with better opportunities, than to identify other places in the country.

Trade and foreign investment are also associated with international migration {Cohen, 1987 #89; Petras, 1981 #225; Portes, 1978 #124}{Massey, 1998 #74}. On the one hand, publicity and the media help to promote lifestyles that are not easily achievable in the communities of origin {Sassen, 1988 #62}. On the other, imported merchandise promotes the idea that the country of origin of the merchandise is a developed and modern place. In addition, individuals working in export processing plants identify the place where their products are destined to as more modern and rich destinations where they can fulfill their new consumer expectations {Fernández-Kelly, 1983 #161}. When

[1] In the case of Mexico, for example, there are few direct bus routes between medium-sized cities. People who want to travel between two neighboring states many times have to travel to a large city in another state first.

choosing to migrate in search of better economic opportunities, individuals move to the countries they are already familiar with.

A similar mechanism can operate in internal migration. The history of internal markets and transportation contributes to the generation of independent economic regions of states that trade among themselves and have less contact with other regions in the country {Coatsworth, 1979 #299}. When deciding to migrate, people might be more likely to know the conditions in those states that have trade with their state of origin than with those states that do not. Also, they might be more likely to identify these states with better living conditions and more resources than the states they are disconnected from.

Internal migration in Mexico

Mexico is an interesting case study for internal migration because in many senses the experience of internal migration in Mexico is typical of the experience of many developing countries. Mexico has a very high rate of internal migration, but this rate has decreased slightly with time. In 1980, 6.5% of the country's population had changed their place of residence between 1975 and 1980[2], 5.2% of the population in 1990 had changed their state of residence in the past 5 years, and 4.6% of the population in 2000 had changed their state of residence in the past 5 years.

As in many other developing countries, the majority of migrants in Mexico during the 1960s and 1970s went to one of the three largest cities in the country, in this case,

[2] This percentage refers to individuals that in 1980 lived in a state different to the state they lived in 1975. The calculation is based on the Population Census and excludes migrants to the United States and those that in 1975 were alive, but died before 1980.

Mexico City, Guadalajara and Monterrey (in order of preference). However, after 1980 migration to these cities diminished, and migrants started moving to other destinations.

As in many other developing countries, the three largest cities in the country, Mexico City, Guadalajara and Monterrey, were among the most frequent destinations of migration during the 1960s and 1970s. However, after 1980 migration to these cities diminished, and migrants started moving to other destinations.

Figure 1 shows the distribution of interstate migrants across destinations for individuals 20 years and older who migrated between 1975 and 1980, between 1985 and 1990, and between 1995 and 2000.

-- Figure 1 about here--

Most migrants in Mexico concentrate in a few destinations, and individuals who migrated between 1975 and 1980 were concentrated in fewer places than individuals who migrated between 1985 and 1990, and between 1995 and 2000. Mexico is divided into 32 states. If migrants from all the states in the country distributed randomly across destinations, each state would receive approximately 3% of all the migrants in the country. Only 8 states in the country received more than 3% of the migrants from 1975 to1980. The five states that received most migrants, in order of importance, were: Mexico and the Federal District, which house Mexico City; Jalisco, which houses Guadalajara; Veracruz; and Nuevo León, which houses Monterrey. In 1985 to 1990, the number of states receiving more than 3% of the country migrants had increased to 9, and Nuevo León had stopped being one of the top 5 destinations. In 1995 to 2000, migrants' destinations had diversified so much, that 10 states received more than 3% of the country migrants, and Jalisco was not among the top 5 destinations.

Not all states in the country send migrants to the same destinations. However, migrants from all states diversified their destinations after 1980. Figure 2 exemplifies this point by showing the distribution of migrants from Hidalgo[3] (which had the 10th largest rate of outmigration in 1975-1980).

-- Figure2 about here --

Individuals who migrated from Hidalgo between 1975 and 1980 moved to only four states in the country. Mexico and the Federal District, the two states that house Mexico City, received each more than 20% of the migrants from Hidalgo in that period. Veracruz and Puebla also received more migrants that would have been expected if migrants from Hidalgo distributed randomly across destinations. Each of these two states received between 3% and 10% of the migrants. Migration to the remaining 27 states was very small, and no other state received more than 3% of the migrants from this origin. However, beginning in 1985, migrants from Hidalgo started moving to other destinations. In 1985-1990, Queretaro received between 3% and 10% of the migrants from Hidalgo, and in 1995-2000 Tamaulipas, Jalisco and Baja California also received more than 3% of the migrants from Hidalgo.

Mexico is also similar to other developing countries in its urbanization and industrialization pattern. Until the mid-1980s, economic development in Mexico was based on a program of import substitution. This model favored industries that were placed in or near the largest cities of the country, so they could take advantage of

[3] This state was chosen as an example because it is one of the states that send most of their migrants to Mexico City and because it has a medium rate of outmigration. However, the diversification in migrants' destinations shown here for Hidalgo is also observed in all the other states in Mexico.

economies of scale and abundant labor supply. Consequently, during this period Mexico City, Guadalajara and Monterrey were not only the largest cities in the country, but also the places were industrialization and economic growth concentrated {Haber, 1989 #332} {Escobar, 1999 #132}. During this phase, internal markets in Mexico were structured in clear-cut economic regions that resembled the economic regions during the XIX and early XX century {Unikel, 1975 #314} {Moreno Toscano, 1972 #306} {Moreno Toscano, 1977 #296} {Moreno Toscano, 1998 #305}. Each region was organized around a city that served as the commercial and administrative center, and most of the states in the region were connected to this city via a modern road or railroad. Also, with the exception of the state containing these core cities, transportation between states of the same region was easier than transportation to other states in the country {Coatsworth, 1979 #299}. Consequently, there was an intense exchange of merchandise among states belonging to the same region, but trade with states in other regions occurred mainly through their commercial centers {Bassols Batalla, 1979 #334}.

Beginning in the mid-1980s Mexico progressively opened its economy to foreign investment and changed its industrialization policy from import substitution to export production. Contrary to the period of import substitution, the new model of industrialization favors places with low tariffs, low wages, and accessibility to international transportation. As a result, new manufacturing centers, export processing zones and agro-industries are located mostly in small and medium cities that were not industrial centers before (Escobar, Bean and Weintraub, 1999) {Garza, 2000 #310}.

In addition, the focus on export processing and the decentralization of industrial production led to a growing trade between states over time. After 1985, trade between

states in different regions has increased. This occurred because of the emergence of new productive zones, and because industries fragmented their production in different locations. For example, {Parnreiter, 2002 #447} shows that after 1985 many big companies moved their production facilities from Mexico City to other states in the center or north of the country. Also, the number of companies that have productive plants in several states of the country increased.

The changes in the industrialization policy of Mexico led to many transformations that can have influenced migration patterns. In the late 1980s and early 1990s, a greater number of states experienced economic growth, and wage and unemployment differentials between states diminished {Hanson, 1997 #368}. According to the neoclassical economy theory of migration, this alone could have led to a decrease in the intensity of migration and to a diversification in migrants' destinations. Similarly, increased trade between states and the diminishing importance of traditional economic regions might have had an important role in the decreased concentration of migrants' in a few destinations. In the following section I present some hypotheses about the relative importance of each of these factors on the changes in the directionality of migration after 1980.

Hypotheses

Historical administrative, commercial and infrastructure ties between states, past migratory trends, and recent trade patterns might help to better explain why migrants move to the states they do, and why their destinations of migration changed after 1980.

The following hypotheses derive from the review of the literature on the directionality of internal and international migration, and from the economic changes Mexico experienced during the last three decades. The first four hypotheses refer to the explanation of why individuals who migrated within Mexico between 1975 and 1980, 1985 and 1990, and 1995 and 2000 move where they moved. The last two hypotheses refer to the factors that explain the changes in migrants' destinations between 1975-1980, 1985-1990, and 1995-2000.

Hypothesis 1: The probability that migrants from state *i* go to state *j* is positively correlated with the wages in *j*, and negatively correlated with the unemployment rate in *j* and with the distance between *i* and *j*. This hypothesis derives directly from the neoclassical theory of internal migration.

Hypothesis 2: The probability that migrants from state *i* go to state *j* is positively correlated with the number of individuals from *i* who live in *j*, This hypothesis derives from the theory of cumulative causation and from past evidence that the destination of new internal migrants in Mexico is associated to the destination of past migrants (Davis, Stecklov and Winters, 2002).

Hypothesis 3: The probability that migrants from state *i* go to state *j* is positively correlated with historical administrative, trade and infrastructure ties between *i* and *j*, and with recent trade ties between *i* and *j*. This hypothesis derives from the literature on international migration that shows that migration between countries is correlated with trade and political exchanges (Cohen, 1987; Portes, 1978; Fernandez-Kelly, 1983); and from the historical economic literature in Mexico that shows that trade between states is determined by its economic regions (Moreno Toscano, 1998; Bassols Batalla, 1979).

Hypothesis 4: The effect of historical administrative and past ties on the probability of migration from *i* to *j* will be larger in the period 1975-1980 than in the periods 1985-1990 and 1995-2000. This hypothesis derives from evidence that historical economic regions lost importance and that trade between states diversified after 1985 (Parnreiter, 2002).

Hypothesis 5: When explaining the differences in migrants' destinations between 1975-1980 and 1980-1985, and between 1975-1980 and 1995-2000, changes in trade between states will be more important than changes in wages and employment. This hypothesis derives from the fact that increased trade between states increases migrants' awareness of new possible destinations. Potential migrants would not be able to perceive the relative increase in wages and employment in some states in Mexico if they did not also have other, related, knowledge about these states.

Data and Variables

This paper uses data from Mexican Population Censuses, from the Studies of Origin-Destination of Cargo Traffic of the Mexican Ministry of Transport {Secretaria de Comunicaciones y Transportes, 2002 #337}, from Mexican road atlases, from Mexican archived historical maps {Ortíz Hernán, 1994 #338}{Florescano, 1983 #295}{Coatsworth, 1984 #333}, and from a review of the historical and political economy literature in Mexico {Coello Salazar, 1965 #301}{Duhau, 1988 #302}. Table 1 shows the indicators obtained from each of these sources. I explain next how these indicators where calculated.

-- Table 1 about here --

Measuring migration flows between states

In this analysis I measure state-to-state migration rates in three different periods. For each time period, I calculate the proportion of those 20 and older who migrated from state *i* to state *j*, based on the census question about where a person lived five years earlier[4]. I only consider the migration of individuals 20 and older because the model I present is a model of migration for economic reasons. The legal working age in Mexico is 16 years old, but many of those 16 to 19 years old who migrate within Mexico move to attend college. Restricting the population of study to individuals 20 and older selects those who migrated to work. The measure of migration collected by the census is the standard measure used in most censuses around the world. This measure might underestimate migration because it ignores temporal migrants (i.e., those who migrated during the 5 year period but returned to their state of origin before the census date), and is thus a conservative estimate. Still, given that migration is a rare event in some states, population censuses are the best alternative for obtaining estimates of migration rates that are comparable across states.

Measuring the factors that affect the distribution of internal migrants

To measure factors considered important for testing the neoclassical hypotheses, I calculate the unemployment rate in each state, the proportion of the labor force who are

[4] The question in 1980 was about the last state of residence and the year of the migration. In this case, I take the migration during the last 5 years, and assume that those who migrated moved only once during the period 1975-1980. This assumption has been commonly used in the literature of internal migration in Mexico (see Partida, Corona, Chavez, among others), and is supported by the results of surveys like ENADID, MMP and EDER, which show that those individuals who migrate within Mexico move an average of only 1.2 times in their lifetime.

non-paid family workers, the proportion of the labor force earning more than twice the minimum wage at the beginning of the decade preceding the observed migration rate, and the distance between capital cities of any two states.

I calculate unemployment rate in each state based on the census questions on economic activity. To measure unemployment, I take the number of people actively looking for a job during the week previous to the census and divide it by the number of people in the labor force. The estimate of the labor force includes the unemployed and all those working in the formal and informal sectors, including self-employed and non-paid family workers. This is the standard measure of open unemployment.

The open unemployment rate underestimates unemployment, especially in places where underemployment and non-paid family work is high {Martin, 2000 #376}. The idea is that many of those who are considered employed but work part-time or work without pay might be also looking for a job. To control for this underestimation, I use the population census to calculate the proportion of the labor force in each state who are non-paid family workers.

The third variable used for the neoclassical hypothesis is the proportion of the labor force in each state who earn more than twice the minimum wage at the beginning of the decade preceding the observed migration rate. This variable intends to measure the earnings level in each state. It is taken from population censuses and includes all earnings from wages, self-employment, sales, rents and other income-earning activities. I use the proportion of the labor force earning more than twice the minimum wage rather than the average earnings of the labor force because this last information is not available for 1970

and 1980. Data from old population censuses are available only in printed tabulations, and these group earnings in categories.

The neoclassical hypothesis of migration states that individuals make their migration decisions based on how better are the employment conditions in the receiving state (*j*) than on the sending state (*i*). Consequently, unemployment, family workers and wages enter my statistical models as the ratio of the unemployment rate in state *j* to the unemployment rate in state *i;* as the ratio of the proportion of the labor force in state *j* who are family workers to the proportion of the labor force in state *i* who are family workers; and as the proportion of the labor force in state *j* earning more than twice the minimum wage to the proportion of the labor force in state *i* earning more than twice the minimum wage.

Distance between states is measured through the distance between their capital cities. Using road atlases published in 1975, 1985 and 1995, I calculate the shortest distance in miles through a modern, paved road between the capital cities of each state.

To measure the effect of prior migration networks upon current migrant flows between two states, I use information in the census about place of birth. I calculate a lifetime measure of migration between two states by counting the number of people born in state *i* who now live in state *j*. This number is then divided by the number of people born in state *i* to create the proportion of natives from *i* living in *j* at the beginning of the decade preceding any observed migration rate.

The effect of the proportion of past migrants on the probability of new migration is not linear. When migration from state *i* to state *j* is not very common, any past migrant has a large, positive, effect on the probability of others migrating because he/she offers

new information and resources about *j* that were not available in *i*. When migration from *i* to *j* is more common, the experience of an additional migrant is less important. The population in *i* is already informed about the conditions in *j*, and it is likely that they know some other past migrant who can help them move. To capture this non-linearity, I also include in the statistical models the squared-term of the proportion of natives from *i* living in *j* at the beginning of the decade preceding any observed migration rate.

The effect of past migrants can run both ways. People from *j* living in *i* can also have an effect on migration from *i* to *j* because they help to diffuse information about their state of origin. I measure this effect by including in my models the number of people born in state *j* who lived in *i* divided by the total population of state *i* at the beginning of the decade preceding any observed migration rate. To capture non-linearities, I also include the squared-term of this variable.

To measure historical administrative, trade and infrastructure ties between two states, I observe whether or not the two states were connected by a main road or railroad anytime before 1910; or if they belonged to the same economic and productive region during the XIX and early XX century. I use Moreno Toscano's definition of economic and productive regions during the XIX century {Moreno Toscano, 1998 #305} and Duhau and Coello Salazar's definition of economic and productive regions during the early XX century {Coello Salazar, 1965 #301} {Duhau, 1988 #302}. This indicator takes the value of 1 if any two states were connected by a main road or railroad or if they belonged to the same economic and productive region, and the value of 0 otherwise.

To measure recent trade between two states, I observe the cargo traffic between them. I use the Studies of Origin-Destination of Cargo Traffic of the Mexican

Ministry of Transport {Secretaria de Comunicaciones y Transportes, 2002 #337}[5] to count the number of cargo vehicles that went from state *i* to state *j* and *vice versa* from1962 (the date when the studies began) until the year prior to the observed migration rate. I then divide this number by the total number of cargo vehicles that started or ended their trip in state *i*. Based on this information, I construct a categorical indicator that takes the value of one if the number of cargo vehicles that traveled between *i* and *j* represents more than four percent of all the cargo vehicles that departed or arrived to *i*. If state *i* traded equally with all the other states in the country, one could expect the same number of cargo vehicles to travel between state *i* and any other state. In that case, each state would be involved in 3.2 percent of all the cargo flows originating in (or going to) state *i*. States that are involved in 4 percent or more of the cargo traffic exchanges of state *i* have stronger trade with this state than the average state in the country.

Finally, population size in each state *j* is included in the models as a control for geographical size. More populated states might be larger and more able to capture migrants than less populated states. In addition, information about more populated states might be more readily available than information about less populated states because they are more likely to dominate the national mass media.

Table 2 presents the mean and standard deviation of the response variables and covariates for each of the three periods of observation.

-- Table 2 about here --

[5] See Annex 1 for an explanation of the methodology and coverage of these studies.

There are 32 states in Mexico, so individuals who migrate between states have 31 possible destinations. Each state *j* captures, on average, 3.23% of the migrants from any state *i*. However, the proportion of migrants captured varies a lot from one state to another. In 1975-1980, the minimum percentage of migrants from any single state *i* that went to any state j was 0.04%, while the maximum percentage was 57.71% (these amounts are not shown in Table 2). In 1985-1990 the percentage of migrants going to any single state varied between 0.05% and 72.63%, and in 1995-2000 it varied between 0% and 68.08%.

The covariates also show great variation, as evidenced by their standard deviations. However, as Hanson notes, the variation between states unemployment rate and wage levels has decreased after 1980 {Hanson, 2002 #373}. At the same time, trade between states has increased. In 1975-1980, any state *i* had a trade tie with 15% of the other states in the country; in 1985-1990, any state *i* had a trade tie with 19% of the other states in the country; and in 1995-2000, it had a trade tie with 26% of the states in the country.

Methods for measuring the effect of the covariates on the distribution of migrants across destinations

I use conditional logit models to evaluate hypotheses 1 to 4. Similar to multinomial models, conditional logit models are used to model discrete choice behavior when individuals can decide between more than 2 options. Still, conditional logit models differ from multinomial models because the choice is modeled as a function of the characteristics of the options available and not as a function of the characteristics of the

individuals deciding[6]. In this case, the proportion of migrants from state *i* that go to state *j* (M_{ij}) is, conditional on the origin *i*, a function of the characteristics of the state of destination *j* (such as unemployment), and of characteristics of the state of destination *j* that are unique to each state of origin *i* (such as distance).

I fit four different models for each of the three periods of observation. The covariates in these models are standardized around their mean to facilitate the comparison of the effects across periods of observation.

The first model, represented by equation 1, is meant to test hypothesis 1. This hypothesis states that once one controls for population size in *j* (P_j) and for the proportion of the labor force in *j* that is self-employed (SE_j) or a family worker (FW_j), the proportion of migrants from *i* that go to *j* is negatively correlated with the unemployment rate in *j* (UR_j) and with the distance between *i* and *j* (D_{ij}), and positively correlated with wages in *j* (W_j), with GDP growth in *j* (GDP_j), and with *i* and *j* being next to each other (C_{ij}). In consequence, I expect that $\beta_1<0$, $\beta_2>0$, $\beta_3>0$, $\beta_6<0$ and $\beta_7>0$ in each of the three periods of observation.

$$M_{ij} = \frac{\exp(UR_j * \beta_1 + W_j * \beta_2 + GDP_j * \beta_3 + FW_j * \beta_4 + SE_j * \beta_5 + D_{ij} * \beta_6 + C_{ij} * \beta_7 + P_j * \beta_8)}{\sum_{\substack{k=1 \\ k \neq i}}^{J} \exp(UR_k * \beta_1 + W_k * \beta_2 + GDP_k * \beta_3 + FW_k * \beta_4 + SE_k * \beta_5 + D_{ik} * \beta_6 + C_{ik} * \beta_7 + P_k * \beta_8)} \quad \text{Eq. 1}$$

The second model (Eq. 2) incorporates the proportion of individuals born in *i* who live in *j* (B_{ij}) to the model in equation 1. This model is meant to test for the hypothesis of cumulative causation of migration, which predicts that $\beta_9>0$.

[6] For more information on conditional logit models, see {Hunt, 2000 #425; McFadden, 1978 #409}.

$$M_{ij} = \frac{\exp(UR_j * \beta_1 + W_j * \beta_2 + GDP_j * \beta_3 + FW_j * \beta_4 + SE_j * \beta_5 + D_{ij} * \beta_6 + C_{ij} * \beta_7 + P_j * \beta_8 + B_{ij} * \beta_9)}{\sum_{\substack{k=1 \\ k \neq i}}^{J} \exp(UR_k * \beta_1 + W_k * \beta_2 + GDP_k * \beta_3 + FW_k * \beta_4 + SE_k * \beta_5 + D_{ik} * \beta_6 + C_{ik} * \beta_7 + B_{ik} * \beta_9)} \quad \text{Eq. 2}$$

The third model (Eq. 3) attempts to prove that the proportion of migrants from *i* that go to *j* is positively associated with the presence of historical ties between *i* and *j* (H_{ij}) and with recent trade between *i* and *j* (T_{ij}). This model does not control for anything else but population size in *j*. According to hypothesis 3, I expect to find that $\beta_{10}>0$ and $\beta_{11}>0$.

$$M_{ij} = \frac{\exp(P_j * \beta_8 + H_{ij} * \beta_{10} + T_{ij} * \beta_{11})}{\sum_{\substack{k=1 \\ k \neq i}}^{J} \exp(P_k * \beta_8 + H_{ik} * \beta_{10} + T_{ik} * \beta_{11})} \quad \text{Eq. 3}$$

Finally, the fourth model is intended to show that the proportion of migrants from *i* that go to *j* is positively associated with the presence of historical ties between *i* and *j* (H_{ij}) and with recent trade between *i* and *j* (T_{ij}), even after one controls for the labor conditions in *j* and past migration between *i* and *j*. According to hypothesis 4, $\beta_{12}>0$ and $\beta_{13}>0$ in equation 4. Furthermore, according to hypothesis 5, β_{12} in the model for 1975-1980 will be larger than β_{12} in the model for 1985-1990, and than β_{12} in the model for 1995-2000.

$$M_{ij} = \frac{\exp(UR_j * \beta_1 + W_j * \beta_2 + GDP_j * \beta_3 + FW_j * \beta_4 + SE_j * \beta_5 + D_{ij} * \beta_6 + C_{ij} * \beta_7 + P_j * \beta_8 + B_{ij} * \beta_9 + H_{ij} * \beta_{12} + T_{ij} * \beta_{13})}{\sum_{\substack{k=1 \\ k \neq i}}^{J} \exp(UR_k * \beta_1 + W_k * \beta_2 + GDP_k * \beta_3 + FW_k * \beta_4 + SE_k * \beta_5 + D_{ik} * \beta_6 + C_{ik} * \beta_7 + B_{ik} * \beta_9 + H_{ik} * \beta_{12} + T_{ik} * \beta_{13})} \quad \text{Eq.4}$$

To facilitate the presentation of the results, the β coefficients of models 1 to 4 are discussed in terms of the odds of migrants from a given state *i* going to a state *j* instead of to a state *g*, when these two destinations do not differ in anything but on the variable of interest. In the case of the unemployment rate, for example, (1-exp(β_1)) represents how larger (or smaller) is the proportion of migrants from state *i* going to state *j* instead than

to state *g* when the unemployment rate of *j* is one standard deviation above the unemployment rate of state *g*, controlling for all the other covariates in the model.

Methods for explaining the changes in migrants' destinations between 1975-1980, 1980-1995 and 1995-2000

The changes in the distribution of migrants across destinations between 1975-1980, 1985-1990 and 1995-2000 can be due to changes in the values of the variables that explain migrants' destinations, or to changes on the way these variables affect migrants' distribution. By changes in the variables that explain migrants' destinations I refer to the transformation of the labor market conditions in the different states in the country, to changes in past migration or population size, and to the increased trade between states. By changes in the effect of the variables, I refer to changes in the β coefficients of model 4 from one period to another.

Oaxaca's decomposition (see {Oaxaca, 1973 #485}) is a method traditionally used to explore how much of the difference in the outcome of two periods is due to changes in the covariates and how much is due to changes in the β coefficients. Unfortunately, I cannot use Oaxaca's decomposition in my analysis because this method is not suitable for discrete-choice models.

To explore how much of the changes in the distribution of migrants across destinations is due to changes in the effect of the covariates, I simulate the patterns of migration for 1985-1990 and for 1995-2000 with the covariates in their observed level, and the β coefficients that resulted from fitting model 4 in 1975-1980. Equation 5 represents the model used for these simulations. These simulations represent what the

pattern of migrants' destinations would have been in 1985-1990 and 1995-2000, had the migrants responded to the covariates in the as they did in 1975-1980, but the conditions in Mexico where the same they were in 1985-1990 and 1995-2000, respectively.

$$\hat{M}_{ij(85/95)} = \frac{\exp\left(UR_{j(85/95)} * \beta_{1(75)} + W_{j(85/95)} * \beta_{2(75)} + \ldots + T_{ij(85/95)} * \beta_{13(75)}\right)}{\sum_{\substack{k=1 \\ k \neq i}}^{J} \exp\left(UR_{k(85/95)} * \beta_{1(75)} + W_{k(85/95)} * \beta_{2(75)} + \ldots + T_{ik(85/95)} * \beta_{13(75)}\right)} \quad \text{Eq. 5}$$

I then compare the distribution of migrants predicted by equation 5 for 1985-1990 ($\hat{M}_{ij(85)}$) with the distribution of migrants predicted by equation 4 for 1985-1990 ($M_{ij(85)}$)[7]. And I compare the distribution of migrants predicted by equation 5 for 1995-2000 ($\hat{M}_{ij(95)}$) with the distribution of migrants predicted by equation 4 for the same period ($M_{ij(95)}$). The larger the difference in the predictions of equation 4 and equation 5, the more one can say the difference in migrants' destinations between 1975-1980 and 1985-1990 and between 1975-1980 and 1995-2000 is due to a change in effect of the covariates.

To explore how much of the changes in the distribution of migrants across destinations is due to changes in the value of the covariates, I simulate the patterns of migration for 1985-1990 and for 1995-2000 with the covariates in their level observed in 1975-1985, and the β coefficients that resulted from fitting equation 4 for the data in 1985-1990 and 1995-2000, respectively. Equation 6 represents the model used for these simulations. These simulations represent what migrants' destinations would have been in 1985-1990 and 1995-2000, had the migrants responded to the covariates in the same way

[7] I compare the results from the simulations with the flows predicted by model 4 instead of with the observed flows because the observed flows are affected by unobserved variables that are not incorporated in any of these models.

they did in each period, but the conditions in Mexico where the same they were in 1975-1980.

$$\hat{\hat{M}}_{ij(85/95)} = \frac{\exp\left(UR_{j(75)} * \beta_{1(85/95)} + W_{j(75)} * \beta_{2(85/95)} + \ldots + T_{ij(75)} * \beta_{13(85/95)}\right)}{\sum_{\substack{k=1 \\ k \neq i}}^{J} \exp\left(UR_{k(75)} * \beta_{1(85/95)} + W_{k(75)} * \beta_{2(85/95)} + \ldots + T_{ik(75)} * \beta_{13(85/95)}\right)} \quad \text{Eq. 6}$$

I compare the results of these two simulations ($\hat{\hat{M}}_{ij(85)}$ and $\hat{\hat{M}}_{ij(95)}$) with the results of fitting equation 4 to the data from 1985-1990 and 1995-2000 ($M_{ij(85)}$ and $M_{ij(95)}$, respectively). The larger the difference between $\hat{\hat{M}}_{ij(85)}$ and $M_{ij(85)}$, and between $\hat{\hat{M}}_{ij(95)}$ and $M_{ij(95)}$, the more one can say the difference in migrants' destinations after 1980 is due to changes in the value of the covariates.

Hypothesis 6 states that, when explaining the difference in migrants' destinations after 1980, changes in trade between states will be more important than changes in wages and employment. To test this hypothesis, I make two additional simulations. First, I simulate what the distribution of migrants across destinations would have been if trade remained in its 1975-1980 level, but all the other covariates (labor market conditions, population size, past migration and infrastructure ties) and the β coefficients were at their values in 1985-1990 and 1995-2000. Second, I simulate what the distribution of migrants across destinations would have been if the labor market conditions (wage, unemployment, family-work and self-employment) remained in their 1975-1980 level, but all the other covariates (population size, past migration, trade and infrastructure ties) and the β coefficients were at their values in 1985-1990 and 1995-2000. According to hypothesis 6, the simulation that keeps trade in its 1975-1980 level should differ more

from the prediction that takes all covariates and coefficients in their true level (Eq. 4) than the simulation that keeps labor market conditions in their 1975-1980 level.

Results

Discussion of results for 1975-1980

Table 3 presents the estimates of exp(β) for the four models fitted to the migration in the period 1975-1980.

--Table 3 about here –

All the coefficients in the four models of table 3 are significant with a $p<0.01$. Migrants during the period 1975-1980 were more likely to go to more populated states than to states with smaller population size. In the four models in table 1, the coefficient for population size in the state of destination is positive. However, the net effect of the population size of the state of destination decreases as one controls for levels of past migration and for the presence of historical ties and recent trade between the states of origin and destination. The β coefficient in model 4 indicates that, comparing two destinations that do not differ in anything but on their population size, migrants are 1.2 more likely of going to a destination with a population 1 standard deviation above the national average than to a destination with the mean population size.

As predicted by the neoclassical hypothesis of migration, migrants tended to go to states with lower unemployment rates, higher wages, greater GDP growth and closest in distance. The β coefficients indicate that migrants from a given state were 22% less likely to go to a destination with an unemployment rate 1 standard deviation above the mean than to a destination with the mean unemployment rate. Similarly, migrants were 117%

more likely to go to a state where the population earning more than twice the minimum wage was 1 standard deviation above the mean than to a destination where the proportion of the population earning more than twice the minimum wage was equal to the national average. Migrants from a certain state are 27% more likely to go to a destination with a GDP growth one standard deviation above the national mean than to a state with the average GDP growth.

The coefficients of the proportion of the labor force self-employed and of non-remunerated family workers are both positive and imply that individuals that, after controlling for unemployment rate, wages, distance and population size of the destination, migrants were more likely to go to states that had more petit entrepreneurs than to states with lower entrepreneurial activity.

The negative effect of distance on the odds of migration to a particular destination is captured on the coefficient of standardized road distance between capital cities and on the coefficient of contiguity between states. Comparing two destinations that do not differ on anything but on their distance from the origin, migrants are 59% more likely to go to the closest of these two destinations. Also, the probability of migrants going to a state that is next to their state of origin is almost three times larger than the probability of migrants going to a state that is not next to their state of origin.

The coefficients for the proportion of the population born in state *i* living in state *j* in model 2 demonstrate the significance of the hypothesis of cumulative causation for domestic migration in Mexico. These coefficients also show that the importance of past migration trends on determining future destinations of migration is not linear, and that it diminishes as the number of people who have migrated to a given destination increases.

The probability of migrants from *i* going to a state where 0.5% of the population born in *i* lives would be 20% larger than the probability of migrants going to a state that had not received any migrants from that origin before. However, the probability of migrants going to a state where 1% of the population born in *i* lives would be only 15% larger than the probability of migrants going to the state that has no prior migration from *i*.

Model 3 is meant to show that the level of migration between two states is very correlated with the presence of historical and infrastructure ties and recent trade between origin and destination. The three variables in this model explain 67% of the deviance in the destinations of migration between 1975 and 1980. Controlling for population size, migrants were 2.4 times more likely to move to a state that belonged to the same economic region or that was historically connected to its state of origin by a main road or by a railroad, than to a state that does not belong to the same economic region. Similarly, migrants were 2.7 times more likely to move to a state that had strong trade with their state of origin than to a state with no trade connection with their state of origin.

Model 4 in table 3 incorporates the variables of the neoclassical and cumulative theory, along with past and recent trade linkages. All the coefficients of this model are significant with a $p<0.01$ and in the direction predicted by the theory. This model provides a better fit to migrants' destinations than models 1, 2 and 3. Altogether, the variables in model 4 explain 85% of the variation in migrants' destinations.

The coefficients of recent trade and past trade and infrastructure ties decrease in magnitude after controlling for the variables suggested by the neoclassical and the cumulative causation theories of migration. Nonetheless, recent trade and past trade and

infrastructure ties make a significant contribution to the explanation of migrants' destination.

The positive and significant effects of past migration, recent trade and past economic and infrastructure linkages of model 4 demonstrate that migrants are more likely to go to states they have more information about. The coefficients of unemployment, the proportion of the labor force employed, distance and contiguity show that when choosing between states they have comparable information about, migrants are more likely to go to destinations that have lower unemployment rates, higher wages and economic growth, and that are closest in distance.

Table 4 presents the percentage of the flows M_{ij} that models 1, 2 and 4 predict correctly within each interval.

--Table 4 about here --

Model 1, which includes only distance, population size and labor market conditions in the place of destination, predicts 93% of the smallest flows (those that capture less than 3% of the migrants) in the correct interval of concentration (that is, it predicts that these flows would be between 0 and 3%). Similarly, model 1 predicts 51% of the flows that capture between 3 and 10% from a given destination, 31% of the flows that capture between 10 and 20% of the migrants, and 70% of the flows that capture more than 20% of the migrants in the adequate interval of concentration.

During the 1970s, the cumulative causation property of migration worked to determine which destinations would receive migrants from a given origin and which destinations would not. However, the number of past migrants does not help to explain why, among destinations that receive migrants, some destinations receive more migrants

than others. Table 4 shows that model 2 predicts the very small flows (flows between 0 and 3%) slightly better than model 1, but does not improve the prediction of the flows that capture between 3 and 20% of the migrants. Even more, model 2 makes a worse prediction of the very large flows (those that capture more than 20% of the migrants) than the neoclassical model.

Infrastructure and past and recent trade ties between states help to explain the concentration of migrants in a few destinations better than the neoclassical model of migration and the theory of cumulative causation of migration. As shown in table 4, model 4 is the model that predicts more accurately the flows in the 0-3%, 3 to 10% and 10 to 20% intervals. And the accuracy in the prediction of flows larger than 20% of model 4 is very similar to the accuracy of the neoclassical model.

An example might help to illustrate how infrastructure and trade ties between states contribute to the concentration of migrants from one state in certain destinations. Figure 3 shows what models 1, 2, 3 and 4 predict for the distribution of migrants from Hidalgo, the example used before, for 1975-1980.

-- Figure 3 about here --

The concentration of migrants from Hidalgo in Mexico City, Veracruz and Puebla during 1975-1980 (see figure 3) is a combined result of the favorable labor market conditions in these destinations, and of the fact that prospective migrants had more information about these states than about other states in the country with equally (or more favorable) conditions. A model that takes into account only the labor market conditions of the place of destination and distance (model 1), predicts that migrants from Hidalgo would distribute across more destinations than they did in reality. This model predicts

correctly a large concentration of migrants in Mexico City, and a medium concentration in Veracruz and Puebla. However, the neoclassical model predicts incorrectly that some migrants would go to Jalisco, San Luis Potosí and Tamaulipas.

The absence of an important migration from Hidalgo to Jalisco in 1975-1980 is explained both through the absence of trade and infrastructure ties between these two states, and through the absence of natives from Hidalgo who had moved to Jalisco before. Until 1975 Hidalgo did not have any commercial activity with Jalisco, and was not even connected through a railroad line or a direct highway with that state. Furthermore, only 0.2% of the natives of Hidalgo had migrated to Jalisco before 1975. Given these conditions, individuals who emigrated from Hidalgo in that period were very unlikely to know what the employment situation in Jalisco was like, or to have some acquaintances there that could help them to migrate.

During the XIX and early XX century Hidalgo belonged to the same economic regions and was linked by a main road or a railroad to Tamaulipas, Querétaro and San Luis Potosí. However, from 1965 to 1975, only 3% of the trade of Hidalgo was with Tamaulipas, and it had no trade at all with Querétaro and San Luis Potosí. As a consequence, the models that incorporate recent trade, infrastructure ties, and the percentage of past migrants (models 2, 3 and 4) predict the destinations of migration from Hidalgo better than the neoclassical model alone.

Discussion of results for 1985-1990

Table 5 presents the exp(β) coefficients for the models for the migration from 1985 to 1990 of the four models fitted.

--Table 5 about here –

All the coefficients in the four models of table 5 are significant with a $p<0.01$. In general, migrants during the period 1985-1990 tended to go to states with larger population size. The β coefficient for the population size of the state of destination in model 1 is positive and implies that controlling for state of origin, distance, unemployment, wage distribution, self-employment and GDP growth, migrants were 9% more likely to go to a destination with a population 1 standard deviation above the national average than to a destination with the mean population size.

Nevertheless, when one controls for the level of past migration (model 2) the coefficient of population size changes sign and is significantly lower than 0. Comparing two states with similar labor market conditions and the same level of past migration, migrants in 1985-1990 were 6% less likely to go to the more populated state than to go to the less populated state. This finding coincides with other studies in Mexico that show a change in the destination of migrants beginning in 1980. In particular, it has been shown that the four largest states in the country (Mexico, the Federal District, Nuevo León and Jalisco) decreased in importance as recipients of migration, and that the migration to smaller states increased (Corona , 1992; Browning and Corona, n.d.; Chavez, 1999; Escobar, Bean and Weintraub, 1999).

The effects of unemployment, wage distribution, distance and contiguity are as predicted by the neoclassical hypothesis of migration. The β coefficients of model 1 indicate that controlling for GDP growth, population size, and distance, migrants from a given state were 9% less likely to go to a destination with an unemployment rate 1 standard deviation above the national mean than to a state with the mean unemployment

rate. In the same vein, migrants were 87% more likely to go to a state where the population earning more than twice the minimum wage was 1 standard deviation above the mean than to a destination where the proportion of the population earning more than twice the minimum wage was equal to the national average.

Distance has a very large effect on the way that migrants distribute across destinations. The probability of migrants going to a state that is contiguous to its state of origin is four times the probability of migrants going to a state that is not contiguous. Similarly, migrants are twice as likely to go to a state that is separated from its origin by the average distance, than to a state that is farer than 1 standard deviation.

The effect of GDP growth of a state on the probability of migrants going there is negative. Individuals who migrated between 1985 and 1990 were 5% less likely to go to a destination with a GDP growth one standard deviation above the national mean than to a state with the average GDP growth. This result is opposite to the neoclassical hypothesis of migration, which predicts that migrants will go to states that are economically more dynamic. However, this result is explained first, by the extremely large GDP growth due to oil extraction in Campeche and Tabasco during the 1980s. The GDP growth of these two states was not immediately accompanied by a comparable growth in their immigration. Second, this result reflects that many migrants continued to go to Mexico City and Jalisco, despite the economic slow down of these states during that period.

Individuals who migrated between 1985 and 1990 were more likely to go to states where other people from their state of origin had moved before. However, the coefficients of model 2 suggest that the effect of past migration is larger for destinations that have not received many migrants in the past, than for destinations that have received

many migrants. When one compares the probability of migrants going from state *i* to two destinations that do not differ on anything but on the number of migrants from *i* that reside there, migrants were 8% more likely to go to a state with a past migration of 0.5% than to a state with no past migration from *i*. The probability of migrants going to a state where 1% of the population born in *i* lives would be 9% larger than the probability of migrants going to a similar state with no past migration from *i*.

The results of model 3 show that after controlling only for population size, historical and infrastructure ties and recent trade between states explain 56% of the deviance in the destinations of migration between 1985 and 1990. On average, migrants were 2.5 times more likely to move to a state that belongs to the same historic-economic region or that was historically connected to its state of origin by a main road or by a railroad, than to a state that does not belong to the same economic region. Also, migrants were 2.9 times more likely to move to a state that had strong trade with their state of origin than to a state with no trade connection with their state of origin.

The level of past migration, distance and labor market conditions in the state of destination reduce the effect of infrastructure ties and recent trade (model 4). However, recent trade and infrastructure ties still have a positive and significant (with a $p<0.01$) effect on the probability of migration to a given destination. After controlling for past migration, distance and labor market conditions, migrants are 63% more likely to move to a state that belongs to the same historic-economic region or that was historically connected to its state of origin by a main road or by a railroad, than to a state that does not belong to the same economic region. Similarly, migrants were 72% more likely to

move to a state that had strong trade with their state of origin than to a state with no trade connection with their state of origin.

Model 4, which incorporates the variables of the neoclassical and cumulative theory and past and recent trade linkages explains 87% of the deviance in the destinations of migrants between 1985 and 1990. This model provides a significantly better ($p<0.05$) explanation of this phenomenon than the models based solely on neoclassical and cumulative causation and on trade linkages.

Social ties (given by the level of past migration) and trade and infrastructure ties are particularly important in explaining why more than 10% of the migrants from one state go to a single destination. This can be seen in table 6, which presents the percentage of the flows M_{ij} that models 1, 2 and 4 predict correctly in a given interval of concentration for migrants during the period 1985-1990.

--Table 6 about here --

The neoclassical model does a good job at predicting which states do not receive migrants from a given state and which states receive a moderate proportion of migrants. The number of flows *Mij* that the neoclassical model predicts in the correct interval of concentration is 91% for flows between 0 and 3%, and 56% for flows between 3 and 10%. However, the neoclassical model predicts correctly only 34% of the cases where the state receives between 10 and 20% of the migrants from one state, and only 48% of the cases where the state receives more than 20% of the migrants from one state.

Adding the level of past migration to the neoclassical model (model 2) increases the correct prediction of highly concentrated flows (those with more than 20% of the migrants) to 59%. And adding trade and infrastructure ties (model 4) increases the correct

prediction of medium concentrated flows (those with 10 to 20% of the migrants) and highly concentrated flows to 42% and 62%, respectively.

Figure 4 shows what models 1, 2, 3 and 4 predict for the distribution of migrants from Hidalgo for 1985-1990.

-- Figure 4 about here --

The neoclassical model predicts correctly that migrants from Hidalgo would go mainly to Mexico City. It also predicts that between 3% and 10% of the migrants from Hidalgo would go to Veracruz, Puebla, and Querétaro. However, this model incorrectly predicts that Nuevo León , Jalisco (the third and fourth largest states in the country, respectively), Tamaulipas and San Luis Potosí would receive between 3% and 10% of the migrants from Hidalgo.

Model 2, which incorporates both the neoclassical and the cumulative causation theories does a better job than model 1 in predicting the destinations of migrants from Hidalgo. In particular, model 2 predicts that migrants from Hidalgo would not go to Nuevo León during that period. However, this model still predicts incorrectly that some migrants would go to Jalisco.

The map for model 3 shows that before 1985 the trade and infrastructure ties of Hidalgo extended through the center and northeast of the country (reaching to Tamaulipas but not to Nuevo León), instead than to the west (to Jalisco). In consequence, the model that incorporates trade and infrastructure to the neoclassical and cumulative causation hypotheses (model 4) predicts the concentration of migrants better than the models that include only the neoclassical and cumulative causation variables (models 1 and 2).

Discussion of results for 1995-2000

Table 7 presents the exp(β) coefficients for the models for the migration from 1985 to 1990 of the four models fitted.

--Table 7 about here –

All the coefficients in the four models of table 6 are significant with a $p<0.01$.

Individuals who migrated between 1995 and 2000 were more likely to move to more populated states than to less populated states. The β coefficient for the population size of the state of destination is positive in the four models fitted.

As predicted by the neoclassical theory, migrants are more likely to go to states that have lower unemployment rates, higher wages, and that are closer in distance. Controlling for GDP growth, population size, distance, wage and self-employment, migrants were 14% less likely to move to a state that had an unemployment rate 1 standard deviation above the national mean, than to a state with an unemployment rate equal to the national average. Similarly, migrants were 17% more likely to move to a state where the population earning more than twice the minimum wage was 1 standard deviation above the mean than to a destination where the proportion of the population earning more than twice the minimum wage was equal to the national average.

Additionally, individuals who migrated between 1995 and 2000 were more likely to go to states that experienced a greater growth in GDP. The coefficient for this variable is positive and significant (with $p<0.01$) in models 1, 2 and 4.

Distance has a negative effect on the probability of migrating to a given destination. According to the results of model 1, the probability of migrants going to a

state that is contiguous to their state of origin is four times the probability of migrants going to a state that is not contiguous to their state of origin. Comparing two states that are not contiguous to the state of origin, migrants are 3% more likely to go to a state that is at the average distance, than to a state that is farer than 1 standard deviation.

Migration during 1985 and 1990 grew cumulatively. Migrants were more likely to migrate to the states where other people from their state of origin had moved before. Nevertheless, the effect of past migration is not linear. The β coefficients for past migration in model 2 show that, everything else being equal, migrants were 9% more likely to go to a state where 0.5% of the population from their state of origin resided, and 14% more likely to go to a state where 1% of the population from their state of origin resided, than to a state that had not received any migrants from their origin before.

Historical and infrastructure ties and recent trade between states are good predictors of where migrants are more likely to move to. Model 3, which includes only population size, historical and infrastructure ties and recent trade between states explains 49% of the deviance in the destinations of migration between 1995 and 2000. On average, migrants were 1.2 times more likely to move to a state that belongs to the same historic-economic region or that was historically connected to its state of origin by a main road or by a railroad, than to a state that does not belong to the same economic region. Also, migrants were twice as likely to move to a state that had strong trade with their state of origin than to a state with no trade connection with their state of origin.

Model 4, which includes the variables of the neoclassical and cumulative theories and past and recent trade linkages explains 82% of the deviance in the destinations of migrants between 1995 and 2000. All the β coefficients in this model are significant with

a $p<0.01$ and in the direction predicted by theory. This model shows the probability of migration to a given destination is conditioned by the level of past migration and by the presence or absence of infrastructure and trade between the state of origin and the different destinations. Past migrants, infrastructure and trade serve as vehicles for information about the alternative destinations, and hence affect which states migrants consider in their sets of options when migrating. When choosing between migrating to states they have a similar level of information about, migrants make their decisions based on distance, wages and unemployment level.

As a result, the level of past migration, infrastructure and trade ties help predict the concentration of migrants in a few destinations. Table 8 exemplifies this point, and shows the percentage of the flows *Mij* that models 1, 2 and 4 predict correctly in each interval of concentration for migrants during the period 1995-2000.

--Table 8 about here --

The prediction of the neoclassical model (model 1) implies that migrants would be more diversified in their destinations than they are in reality. This model only predicts correctly 22% of the flows that capture between 10% and 20% of the migrants from one single origin, and 33% of the flows that capture more than 20% from one single origin. Adding the level of past migration to the model (model 2) improves the prediction of flows that capture more than 20% of the migrants, but it does not help the prediction of flows between 10 and 20%. Infrastructure and trade ties improve the prediction of flows from all sizes. Model 4 predicts correctly 94% of the smallest flows (flows between 0 and 3%), 42% of the moderate flows (flows from 3 to 10%), 27% of the medium flows (flows from 10 to 20%), and 44% of the largest flows (flows of more than 20% of the migrants).

Figure 5 shows what models 1, 2, 3 and 4 predict for the distribution of migrants from Hidalgo for 1995-2000.

-- Figure 5 about here --

The neoclassical model (model 1 in figure 6) predicts that migrants from Hidalgo in 1995-2000 would concentrate in the surrounding states, and fails to predict the migration to Jalisco, Baja California and Tamaulipas altogether. Model 2, which incorporates the percentage of past migrants to the neoclassical model predicts the migration to Jalisco correctly, but does not predict the migration to Baja California and Tamaulipas.

During the late 1980s and early 1990s, trade from Hidalgo extended to the northwestern states of the country, reaching to Jalisco, Zacatecas and Tamaulipas, among others (see model 3 in figure 6). This diversification in the trade patterns from Hidalgo was due to the establishment of export-processing zones and agro-industries in these states. As trade between states intensified, the information that natives from Hidalgo had from other states in the country increased. In this case, trade helps to explain why during 1995-2000 migrants from Hidalgo went to Jalisco and Tamaulipas, even when the neoclassical and the cumulative causation models forecasted a very small migration to these destinations.

In consequence, the model that incorporates trade and infrastructure to the neoclassical and cumulative causation hypotheses (model 4) does a much better job than all the other models in predicting the pattern of migrants' destinations. The only flow that this model fails to predict is the migration from Hidalgo to Baja California. This might be

because the trade between Hidalgo and Baja California is more recent, and I did not capture it adequately in the trade variable.

Changes in the determinants of migrants' destination between 1975-1980, 1985-1990 and 1995-2000

An informal comparison of the β coefficients of model 4 for the three periods analyzed shows that the effect of the covariates on the probability of migrating to a particular destination varies between 1975-1980, 1985-1990 and 1995-2000[8]. In particular, the effects of unemployment, wages, distance, infrastructure ties and the level of past migration seem to be larger in 1975-1980 than in 1985-1990 and in 1995-2000. The effect of trade ties increased during the 1980s, but in the 1990s returned to its 1970s level.

One implication of this comparison is that a difference of 1 standard deviation in the rate of unemployment would signify a larger difference in the proportion of migrants from a given origin that two destinations received in 1975-1980 than it would in 1985-1990 or in 1995-2000. On the contrary, if one compared the proportion of migrants going to a state that had trade with the state of origin with the proportion of migrants going to a state that did not have trade with the state of origin, the difference in the two proportions would be larger in 1985-1990 that it would in 1975-1980.

Not only did the effect of the covariates change between 1975 and 2000. Labor market conditions in the places of destination were also transformed. In addition, internal

[8] One can compare the magnitude of the β coefficients of the equations for 19751980, 1985-1990 and 1995-2000 because the covariates in the three periods are standardized. In each case, the β coefficients represent the effect of an increase of 1 standard deviation of each covariate in the flow *Mij*. Still, this comparison is informal and does not have any statistical corroboration.

markets diversified and the number of states each state traded with increased. Table 8 gives an idea of how much of the changes in migrants' destinations from 1975-1980 to 1985-1990 is due to changes in these variables and how much is due to the change in their effect. This table shows what percentage of the flows predicted with the value of the covariates and β coefficients in 1985-1990 coincides with the flows simulated for the same period using the β coefficients in 1975-1980 and the value of the covariates in 1985-1990. It also shows what percentage coincides with the flows simulated using the β coefficients in 1985-1990 and the value of all the covariates in 1975-1980; what percentage coincides with the flows simulated using the β coefficients in 1985-1990, the value of the labor market covariates in 1975-1980 and the value of all other variables in 1985-1990; and what percentage coincides with the flows simulated using the β coefficients in 1985-1990, the value of the trade variable in 1975-1980 and the value of all other variables in 1985-1990.

-- Table 9 about here --

Table 9 shows that the change in the effect of the covariates contributed more to the diversification of migrants' destinations from 1975-1980 to 1985-1990 than the change in the level of the variables. 37% of the flows that captured between 10% and 20% of the migrants from one origin, and 72% of the flows that captured more than 20% of the migrants would have had that intensity if the labor market conditions, trade, infrastructure and past migration in 1985-1990 have had the same effect on migration that they did during 1975-1980. However, only 26% of the flows that captured between 10% and 20% of the migrants from one origin, and only 28% of the flows that captured more than 20% of the migrants would have had that intensity if the labor market conditions,

trade, infrastructure and past migration in 1985-1990 had remained in the level they were in 1975-1980.

Moreover, the change in the labor market conditions of the states of destination had more impact on the change of migrants' destinations between 1975-1980 and 1985-1990 than the change in trade. The flows simulated when trade is left at its 1975-1980 level but all the other variables and their effects are at their 1985-1990 level are very similar to the flows predicted with the true value of trade in 1985-1990. However, the flows simulated when the labor market conditions are left at their 1975-1980 level differ considerably form the flows predicted with the labor market conditions in 1985-1990. 63% of the flows that captured between 10% and 20% of the migrants from one origin, and 72% of the flows that captured more than 20% of the migrants would have had that intensity if the labor market conditions of the states of destination had remained at their 1975-1980 level.

Table 10 shows what percentage of the flows predicted with the value of the covariates and β coefficients in 1995-2000 coincides with the flows simulated for the same period using the β coefficients and covariates in 1975-1980.

--- Table 10 about here ---

The change in the destinations of migration from 1975-1980 to 1995-2000 is explained both by changes in the way that labor market conditions, past migration, infrastructure and trade affect migration patterns, and by changes in the level of these variables. For example, only 26% of the flows that captured between 10% and 20% of the migrants from one origin in 1995-2000 would have captured that many migrants if covariates have had the same effect on migration that they did during 1975-1980.

Similarly, only 15% of the flows that captured more than 20% of the migrants from one origin would have had that intensity if the labor market conditions, trade, infrastructure and past migration in 1995-2000 had remained in the level they were in 1975-1980.

The diversification of trade has a larger role in explaining the changes in migrants' destinations from 1975-1980 to 1995-2000 than the changes in labor market conditions. The flows simulated for 1995-2000 when one holds trade constant at its 1975-1980 level differ more from the flows predicted with trade and labor market conditions in their observed level than the flows simulated when one holds labor market conditions in their 1975-1980 level.

The effect of trade on the change in migrants' destinations is not evident but until 1995-2000 because it is after 1990 that the emergence of new poles of development took full force in Mexico. The pattern of trade between states was very similar for 1975-1980 and for 1985-1990. However, after 1990 states traded with more states than they did before. One consequence of this "de-regionalization" of trade has been that the individuals who migrated between 1995 and 2000 had more information about alternative destinations than the individuals who migrated before them. In result, migrants have started migrating to destinations they had not gone before, and concentrating less in the traditional destinations.

Conclusions

The results of this paper are of importance to the literature on internal migration, and to studies about the consequences of the change in the model of industrialization in development countries.

I contribute to the literature on internal migration by incorporating in the explanation of migrants' destinations some factors that have been proved important in the case of international migration, but had not been incorporated to the study of internal migration before. I show that in the case of interstate migration in Mexico, migrants' destinations cannot be predicted solely by differences in the level of wages and unemployment as the neoclassical model of migration predicts. Migration patterns in the past affect the destination of future migrants because these are more likely to go to the states that other migrants have gone to in the past. Also, recent trade and historical administrative, commercial and infrastructure ties between states of origin and destination are important predictors of where migrants will move. Migrants in Mexico are more likely to go to a state that is in the same historical-productive region than their state of origin, or to a state that is not in the same historical productive region but has recent trade with their state of origin, than to a state that does not trade and does not belong to the same productive region than their state of origin.

The transition of the Mexican economic policy from import substitution to an export oriented economy from the mid-1980s has had important consequences in the way that migrants distribute across destinations. After 1980, migrants concentrate less in a few states and have started migrating to places that were not important destinations of migration before. These changes in migrants' destinations are the result of the transformation in labor market conditions in different states of the country and by a diversification in the trade between states brought by the process of economic restructuring. Still, the effect of the diversification in trade has been larger than the effect of the changes in labor market conditions. The establishment of new agro-industries and

manufacturing zones across the country lead to lower wage and employment differentials between states (Hanson). In consequence, the incentives for migrating to the traditional industrial centers (like Mexico City or Jalisco) diminished, while the incentives for migrating to new developing poles (like the central states or to the Gulf of Mexico) increased. Nonetheless, the diversification in trade between states seems to be what allows potential migrants to realize the changes in the structure of job opportunities in the different regions of the country. If the pattern of trade between states had not changed after 1980, individuals who migrated between 1985 and 1990, and between 1995 and 2000 would concentrate in the same states than individuals who migrated between 1975 and 2000.

The allocation of migrants across destinations has important consequences for the distribution of the population in a country. It is important to understand what drives individuals to concentrate in some states and not in others, and how changes in the economic policy of a country affect migrants' destinations. Studies from an urbanization perspective have noted that in some cases the shift from import-substitution to export-oriented development leads to a redistribution of the population away from the largest cities in the country. This happens when the new manufacturing centers are located away from the largest cities and have the capability to generate abundant employment because migrants start moving to new, farer destinations. However, when the new industrial centers are close to the largest cities the result is a more acute concentration of the population. New industrial centers merge with the old metropolitan centers, resulting in a megalopolization {Portes, 1997 #327}.

The results of this research bring a new dimension to the study of Portes and colleagues. They suggest that the long-term impact of the change in economic policy on the distribution of the population does not depend solely on the location of the new manufacturing centers, but also on the way that the production is fragmented in different locations and on the way trade between states is reorganized.

A similar explanation might be behind the changes in migrants' destinations in other countries that have experienced a transformation in their economic policy recently, like China {Liang, 1997 #400} {Poston, 1998 #494}. All the studies that try to explain why migrants in this country go to where they do still rely exclusively on economic variables, such as wages, unemployment and investment in the state of destination. However, if the results presented in this paper apply in other contexts, future concentrations of migration might be better predicted by also taking into account the structure of administrative ties between states and internal markets.

One of the arguments raised in this paper is that past migration, infrastructure, administrative ties and trade between states contributes to explaining the distribution of migrants across destinations because these factors are related to migrants' awareness about their potential destinations. There might be other variables that are also associated to the knowledge that potential migrants have about the different states in a country, but more research is needed to identify them.

In this paper I concentrate on what explains that individuals who migrate within Mexico go to the states they do. However, this is only part of the equation when one is trying to understand why some states receive more migrants than others. The number of migrants that go to any state also depends on how many individuals leave their state of

origin. Future research should explore how the rates of outmigration interact with migrants' choice of destination to explain the distribution of internal migrants in a country.